

**ABSTRACT OF THE INVENTION**

The present invention relates to identification of agents that play a role in regulating brain amyloid- $\beta$  ( $A\beta$ ) levels *in vivo*. The invention provides compounds and methods of using such compounds to treat amyloidogenic conditions. It also provides a useful animal model for screening for and evaluating candidate amyloid inhibiting or therapeutic compounds. In particular, ovariectomy (ovx) and estrogen replacement were found to affect brain  $A\beta$  levels in guinea pigs. Long-term ovx of guinea pigs resulted in increased levels of total brain  $A\beta$ , as compared to intact animals, and the  $A\beta_{42}/A\beta_{40}$  ratio was also elevated. Treatment of ovx guinea pigs with  $\beta 17$ -estradiol for ten days partially reversed the ovx-associated increase in brain  $A\beta$  levels.

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